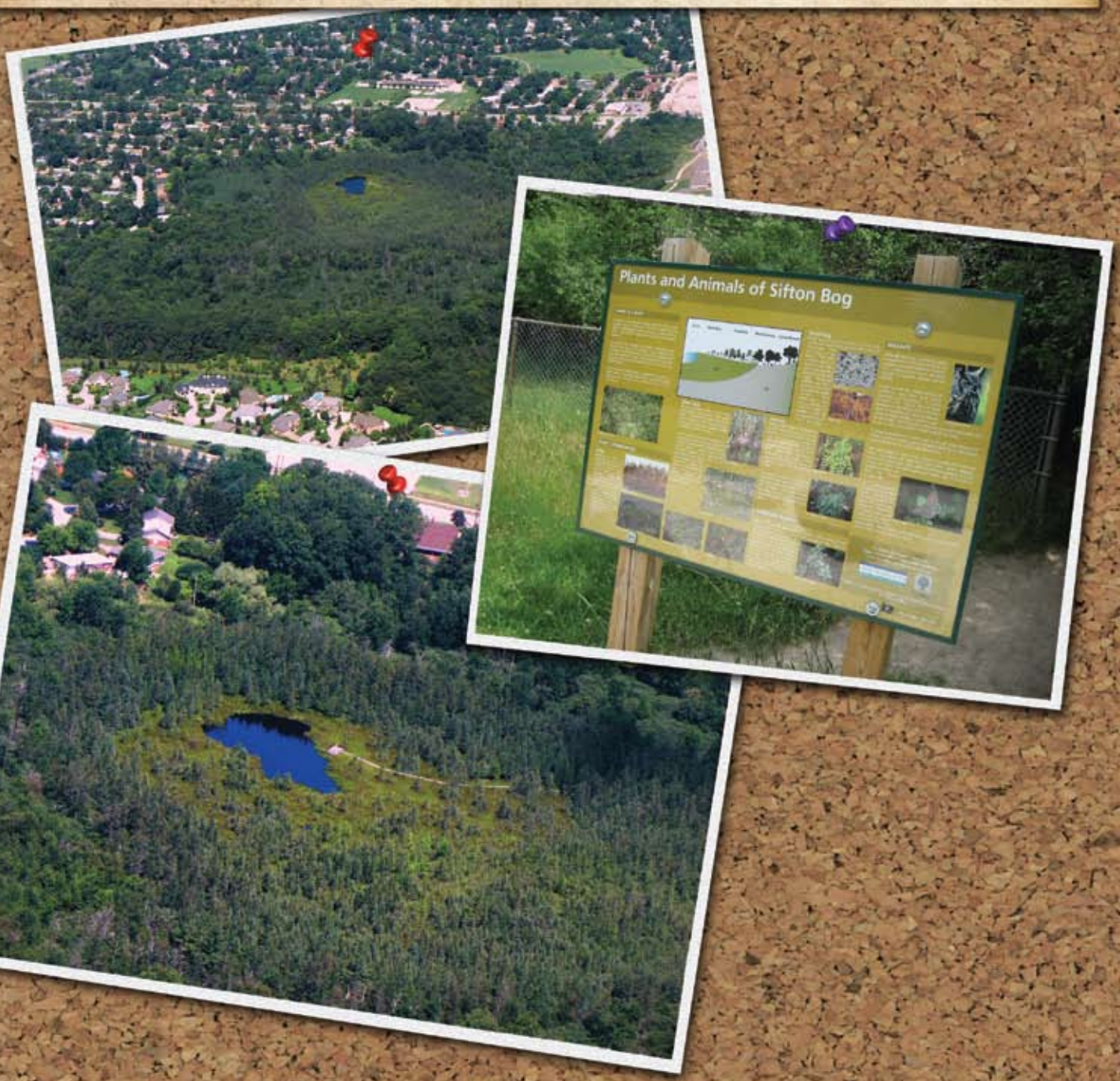
Sifton Bog ESA Conservation Master Plan 2009 - 2019



1.0 Sifton Bog ESA Conservation Master Plan 2009 - 2019

Aerial view of Sifton Bog looking east, 2001 (Photo: Bruce de Boer)

1.1 Plan Area

Sifton Bog Environmentally Significant Area (ESA) is a 50-hectare (124-acre) wetland complex located in northwest London, south of Oxford Street and west of Hyde Park Road (Map 1). The ESA is owned by the Upper Thames River Conservation Authority (UTRCA, 30 ha), City of London (10 ha) and private landowners (10 ha). Map 2 illustrates the property ownership as of December 2006. This Master Plan focuses on the public ESA, with some reference to private lands as applicable.

The bog consists of a central pond (Redmond's Pond) surrounded by a floating shrub bog on deep *Sphagnum* moss, a Black Spruce and Tamarack treed bog and a narrow band of Black Spruce swamp forest. This central bog portion (about 23 ha in size) is contained within a large, mixed and deciduous swamp forest, buckthorn thicket swamp, and small open marsh areas at the interface of the wetland with upland. Slopes around the wetland consist of young to mature deciduous forests, shrub thickets and regenerating old fields.

The bog is shown in the Historical Atlas of Middlesex County (1878) as lying along the boundary between the Redmond and Foster Farms. The first recorded scientific interest in the site occurred in 1888, from which date naturalists, geologists and ecologists began collecting information on the bog's plants and wildlife. Early management practices were directed toward peat extraction, cultivation for agriculture, Christmas tree harvest, and intentional planting of Glossy Buckthorn for harvest. Some early research and studies were carried out by University of Western Ontario professors and graduate students. It was not until the 1950s that the idea of the uniqueness of the bog and the need to preserve it really gained momentum. Dr. W.W. Judd was the catalyst for this effort.

The bog was first zoned as open space in 1957 by the Township of London (prior to annexation by the City of London) and has been protected ever since. Sifton Bog is one of the most southerly bogs in Canada as well as one of the largest in this area. The Black Spruce-Leatherleaf-*Sphagnum* bog vegetation association is a disjunct boreal community, that is, a discrete association isolated from its main geographical range and location, which is circumpolar (Figure 1).

Sifton Bog is delineated as an Environmentally Significant Area (ESA) on Schedule B1 of the Official Plan for the City of London and has a land use designation of Open Space on Schedule A. It is zoned OS5 (Open Space 5), which is the most restrictive designation in the Z-1 Zoning By-law, allowing for habitat preservation and only passive recreational use. Sifton Bog is also recognized as a Provincially Significant Wetland (PSW) and a Life Science Area of Natural and Scientific Interest (ANSI-LS) by the Ontario Ministry of Natural Resources. The Sifton Bog has also been catalogued as an International Biological Programme (IBP) site in Region 5, Area 259 (Waldron 1972; Falls, Macdonald and Beechey 1990).

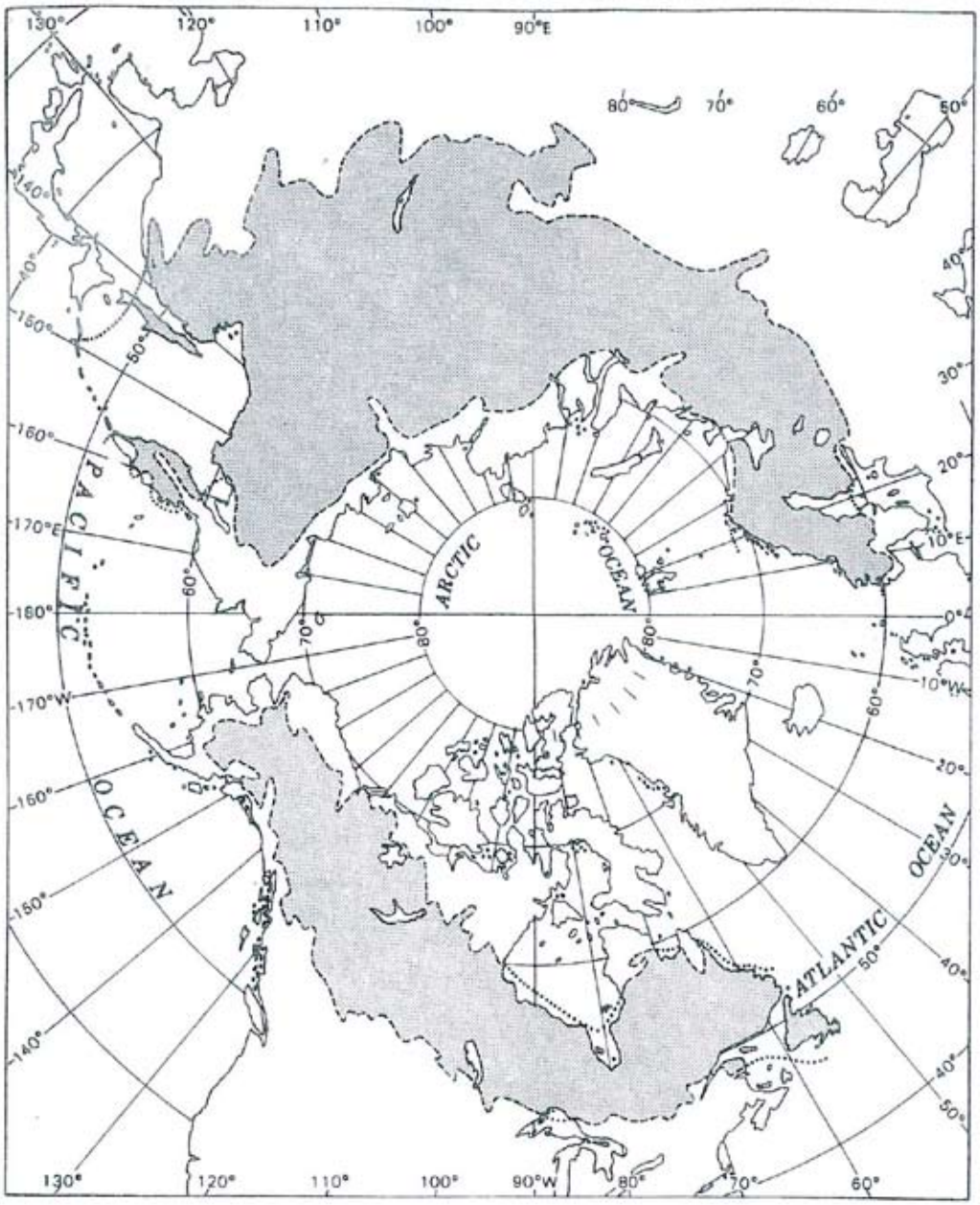


Figure 1. The circumpolar range of the boreal forest (Source: Hare and Ritchie 1972; reprinted in Larsen 1980)

In the 1950s, the bog was surrounded by agricultural fields (Map 7a). Today, Sifton Bog is completely surrounded by residential, institutional and commercial development that isolates it from other natural areas (Map 1). The nearest natural feature is the Thames River corridor, which is located 500 metres southwest of the Sifton Bog.

1.2 Purpose of the Conservation Master Plan 2009 - 2019

In the City of London's Official Plan, Parks and Recreation Policies (chapter 16), Environmentally Significant Areas are classified as either city-wide or regional parks within the hierarchy of the municipal parks classification system (City of London 2006). All ESAs are primary or core components of the Natural Heritage System and, therefore, are subject to the Environmental Policies of Section 15. Details governing the management and use of identified ESAs may be contained within a Conservation Master Plan, as provided for in policy 15.3.8, which states:

Conservation Master Plans for ESAs may be adopted by Council, and will function as guideline documents for the purposes of defining the boundary and providing direction in the management of these areas.

Seven of the City's 20 ESAs are owned and managed by the City of London and Upper Thames River Conservation Authority. ESAs contain natural features and perform ecological functions that warrant their retention in a natural state. These significant natural areas cannot tolerate unlimited human use and must be managed following a consistent approach that protects the features and functions of the ESA, while providing controlled access, interpretive signage and appropriate and compatible passive recreational opportunities.

Previously, Sifton Bog has been managed under the guidance of the Sifton Bog Integrated Resource Management Study (IRMS) (Upper Thames River Conservation Authority 1992). This comprehensive report and background study was completed cooperatively by the City, UTRCA and private sector interests. It was approved by Municipal Council on August 4th, 1993 as a resource document to be used as supporting background information in the review and assessment of future development applications on the lands surrounding the Sifton Bog. Hydrogeological, water chemistry and life science specialists studied the bog between 1990 and 1992. Resource-related recommendations were made for the future management of the bog's hydrogeological, hydrological, biological and recreational resources. In addition, recommendations were made relating to the compatibility of future urban land uses with the wetland functions of the bog.

With all lands surrounding the bog now fully built up with low- and medium-density residential and commercial development, it is necessary to prepare a new Conservation Master Plan. The new plan will address the preservation of the ecosystem health and integrity of the Sifton Bog through appropriate conservation management. Key components of this plan are:

1. to review recommendations of the 1992 Integrated Resource Management Study to flag any issues that have not yet been implemented;
2. to document major changes that have occurred to the ecology and hydrology of the Sifton Bog (wetland and upland) resulting from the spread of non-native invasive species, the overpopulation of resident deer, pressure from adjacent land development and human uses;
3. to identify the stressors of the Sifton Bog ESA and their impact on successional processes over time, to provide new direction for the sustainable conservation of this Environmentally Significant Area;
4. to coordinate hydrological and biological monitoring programs;
5. to establish "reference conditions" (state of health) to which system form and function can be compared over time.

1.3 Plan Team

The Upper Thames River Conservation Authority (UTRCA) was retained by the City of London in June 2006 as the primary consultant responsible for coordinating the Conservation Master Plan. The UTRCA worked with a Local Advisory Committee (LAC) consisting of representatives from the following:

- The City of London
- McIlwraith Field Naturalists of London
- Neighbours
- Concerned citizens and residents
- Educators
- Ecological and Environmental Planning Advisory Committee (EEPAC)
- Oakridge Hazelden Community Association / Friends of Sifton Bog
- White-tailed Deer Steering Committee
- UTRCA ESA Management Team

Cathy Quinlan (UTRCA Terrestrial Biologist) and Bonnie Bergsma (City of London Ecologist Planner) were the primary authors of this plan. They described the natural heritage components (vegetation associations, flora and fauna) of the ESA over time, and assembled a comprehensive history of land use activities. Bill DeYoung (Bradwill Ecological Consulting) and Bergsma assembled the academic studies and theses pertaining to the Sifton Bog, and developed the Stress-Response-Outcome model that was presented at the Parks Research Forum of Ontario in 2007.

Linda Nicks (UTRCA Hydrogeologist) and Bergsma consolidated and analyzed the water quality and quantity information. Blagy Novakovic (retired Ministry of the Environment hydrogeologist) assisted with the interpretation of the hydrogeology. Jeff Bruin (City of London Landscape Architect/Parks Planner) facilitated the recreational and trail planning component of the plan. Steve Sauder (UTRCA Marketing Specialist) facilitated the community consultation process. Philip Simm (UTRCA GIS Specialist) produced the digital maps. DeYoung produced Figures 13-18 and Appendices D, E and F.

Alex Shivas (UTRCA Coordinator, Lands & Facilities Unit) and Andrew Macpherson (City of London Manager of Parks Planning & Design) provided expertise on property and operations issues.

1.4 Planning Process

Public participation is an important component of all Conservation Master Plan processes. A community consultation process was undertaken from September 2006 to January 2009 to solicit community input.

Step 1. Launch of Conservation Master Plan (September – October 2006)
- Hold media launch and issue news release
- Develop factsheet to describe the Master Plan process (Appendix A1)
- Host Doors Open event at Sifton Bog with guided hikes (September 2006)

Step 2. Data Collection and Public Outreach (October – December 2006)
- Gather resource information (literature search and field work)
- Develop a stakeholder and neighbourhood contact list
- Host a public/community Open House meeting to explain the Conservation Master Plan Process and produce and distribute invitations (Appendices A2, A3)
- Host a Local Advisory Committee Meeting (November 2006)

Step 3. Report Writing and Local Advisory Committee Consultation (November 2006 – October 2007)
- Host Local Advisory Committee Meetings to garner input on priorities (five meetings between November 2006 and October 2007). Notes from the first meeting are included in Appendix A3.
- Conduct field work in 2006 - 2007 (Appendix B)
- Circulate draft reports to partners and LAC (October 2007)

Step 4. Final Report and Release (November 2007 – January 2009)
- Incorporate comments, edits and information gaps into the report
- Circulate revised report to partners and LAC
- Host a second public/community open house meeting to explain the outcomes of the Conservation Master Plan Process (Appendix A4)
- Incorporate final changes to the document
- Present Conservation Master Plan to Planning Committee and City Council

1.5 Property Management

Before 2001, management of the property by the City of London and the UTRCA occurred informally as required or in cooperation with community groups. In the 1970s the City's Public Utilities Commission (precursor to the Parks Planning and Design Section) worked with the community to construct the first boardwalk and trail system. Today, there are 350 metres of boardwalk and 2 km of passive trails within publicly owned areas of Sifton Bog ESA.

Management of this ESA and the six other ESAs owned by the City and/or UTRCA became more formalized in 2001 when the UTRCA entered into an agreement with the City of London to create an ESA Management Team operating from the UTRCA office. The ESA Team's activities include trail maintenance, annual hazard tree inspections, boardwalk construction, encroachment monitoring and removal, education of school children, and enforcement. Several members of the ESA Team are Provincial Offences Officers. They can lay charges and fine people under the Conservation Authorities Act, Parks By-law or Trespass to Property Act relating to after-dark activities, dogs-off-leash, bicycles, and vandalism. Fines range between $65 and $220. The ESA Management Team also carries out habitat enhancement and wildlife monitoring work as directed by ecologists and land managers from the UTRCA and City of London. Maintaining ecological health is the joint responsibility of both agencies.

1.6 Reports and Research

1.6.1 Academic Research Reports

The Sifton Bog has been the subject of a number of academic research projects, some resulting in the publication of Masters theses. Crawford (1926) studied environmental factors influencing the growth of Leatherleaf. Wu (1989) carried out three quantitative analyses of a data matrix of 22 descriptors (19 species and three environmental factors: pH, nitrate and phosphate) over 90 quadrats. Luckman (2007 unpublished) used dendrochronology of Tamarack and Black Spruce to examine the environmental history of the Sifton Bog.

1.6.2 Groundwater Studies

Table 1 lists the major groundwater studies conducted in Sifton Bog ESA. Gartner Lee Ltd. (1979) completed the first detailed hydrogeological study to delineate the extent of the organic subsoil, determine the relationship of the bog to the surrounding geologic setting, develop a water budget, and examine the groundwater quality within the bog. These investigations were required to determine if proposed development would adversely affect the hydrogeological environment of the Sifton Bog.

In 1989, the UTRCA commissioned additional background studies of the earth science and life science features to establish baseline conditions, as part of an integrated resource assessment. These studies included further evaluation by Golder Associates Limited of the hydrogeologic regime. Two groundwater-level and water-quality-monitoring wells were installed in Redmond's Pond (north and south) and six sets of shallow and deep wells were installed on the tableland surrounding the bog (Map 3) (Well 3 near Hartson Place does not have a corresponding deep well). These wells continue to be monitored by UTRCA staff, and samples are submitted to the City of London laboratory for analysis.

In 1998, Applegate Groundwater Consultants installed five new groundwater monitoring wells (boreholes) within the bog where none previously existed (Appendix L1 and Map 3). Wash boring, hand augering and manual slide hammer techniques were employed to install these wells as it was not possible to use conventional drilling equipment in the bog.

Table 1. Summary of Key Groundwater Studies

Authors	Year	Title
Gartner Lee (for Proctor and Redfern)	1979	Detailed Hydrogeological Study Final Report: Sifton Bog
Golder Associates Ltd.	1992	Sifton Bog Integrated Resource Management Study: Hydrogeological Evaluation
Applegate Groundwater Consultants	1999	The Sifton Bog Monitoring Program Groundwater Component
UTRCA / City of London	1990 +	Unpublished monitoring of 11 paired shallow and deep wells at six locations around the bog to establish baseline conditions

Two of the monitoring wells, 5S and 6S, have been included in the Provincial Groundwater Monitoring Network (PGMN) and have been equipped with automated meters. In 2004, Well 5S was equipped with a level-logger that records conductivity, water level and water temperature on an hourly basis. Well 6S was equipped with an electronic water level meter in 2004; it records water level and water temperature on an hourly basis.

1.6.3 Vegetation Studies

Numerous qualitative and quantitative vegetation inventories of the Sifton Bog date from 1926 to 2008, thus allowing an assessment of vegetation and species changes over time (Table 5). Three inventories of moss species have been made: in 1969 (Judd – *Sphagnum* mosses), in 1971 (Cook – other mosses) and most recently 1998 - 2000 (BioLogic 2001, as part of a detailed monitoring program). For this latter program, a series of 13 permanent vegetation plots was established in the bog proper and sampled twice to establish a baseline for future monitoring to detect changes. Within each of these 13 plots, Applegate Groundwater Consultants sampled the organic *Sphagnum* mat and the soft sediment beneath the mat, and probed to find the depth to the firm bottom of the bog (Appendix C and Map 5).

1.7 Vision for Sifton Bog ESA

1.7.1 Mission Statement

The Local Advisory Committee (LAC), which includes citizens, City of London and UTRCA staff, developed the following mission statement:

> *The primary mission is to conserve the ecological health and uniqueness of Sifton Bog Environmentally Significant Area. A secondary priority is the provision of appropriate educational and recreational opportunities.*

1.7.2 Guiding Principles

Three Guiding Principles were developed and endorsed by the LAC and agencies. These are listed below.

- Conserve ecological health for the long term
- Promote awareness of unique natural features
- Work with the community to coordinate awareness, education, and appreciation efforts

1.7.3 Criteria for Decision Making

The LAC developed the following criteria for decision making. These criteria are used as a planning tool to provide guidance in making clear, logical choices for the management of Sifton Bog ESA.

- Must honour goal of promoting ecological health as highest priority
- Must aim to maintain the features for which the site was designated an ESA by the City of London. The ESA criteria met include:
  - o unusual landforms (raised kettle bog),
  - o rare and uncommon natural communities (boreal bog communities which form a distinctive landform-vegetation type),
  - o habitat for species with a narrow ecological niche (20% native species with a coefficent of conservatism 8, 9 and 10),

  - unique hydrologic functions (ombrotrophy, nutrient-poor water, water storage, lagg zone),
  - high biodiversity of species,
  - important wildlife habitat function (disjunct boreal species),
  - significant habitat for rare species.
- Must be consistent with the mission statement, guiding principles, goals and objectives (Table 16 in Section 8.2)
- Must allow natural successional processes of the bog to occur
- Must manage ecosystem stresses
- Must minimize impacts of all human uses (e.g., trails)
- Must be fiscally responsible
- Must monitor to detect negative influences (e.g., contaminated runoff) within the entire basin

1.7.4 Key Management Issues

The Local Advisory Committee reviewed the issues recorded at the community meeting on September 19th, 2006 (Appendix A3) and two written submissions received. Based upon discussion of the issues, the following list of key issues for Sifton Bog was developed (listed in no particular order of priority):

- Acquisition of priority private properties
- Deer overpopulation / travel patterns
- Research, education, appreciation
- Trails and access points
- Invasive species
- Water quantity monitoring to maintain acceptable water levels within the acrotelm (upper peat layer)
- Water quality (to maximize source control and capture of contaminated water)
- Ability to naturalize / restore
- Vegetation monitoring especially for bog plants on *Sphagnum*